

MEBT + 4 RT CH layout based on quadrupole triplets

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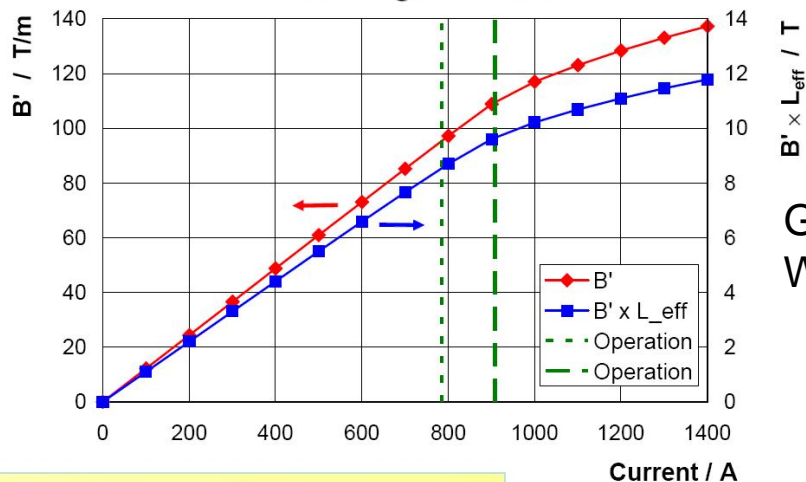


Available Quads: Length 10 cm, gap between coils 5 cm, gradient 29 T/m max,
Max current 220 A, pulsed – 3% duty factor, bore 4 cm

Bob Webber: The ballpark parameters we need are something like: Bore - ~4 cm maximum physical length - ~10 cm coil-to-coil and flange-to-flange gradient strength - ~20 tesla/meter integrated gradient*effective length = ~2.4 tesla



Yoke length 81 mm



GSI quadrupole magnets.
Water cooled?

Yoke outer diameter	130 mm
Yoke length	42 / 49 / 67 / 81 / 97 mm
Yoke material	VACOFLUX 50
Magnet aperture diameter	20 mm
Number of turns per pole	5

Bob's parameters have been
used in simulations

BEAM AT NEL1= 1

H A=-0.68000 B= 0.33300
V A=-0.68000 B= 0.33300

15.000 mm X 20.000 mrad

Z A= 1.1196 B= 0.58400

35.000 Deg X 200.00 keV

NP1= 1

I= 10.0mA
W= 2.5000 3.0849 MeV
FREQ= 325.00MHz WL= 922.44mm
EMIT= 17.300 17.300 675.00
EMIT= 15.571 15.571 675.00
N1= 1 N2= 43
PRINTOUT VALUES
PP PE VALUE
MATCHING TYPE = 8
DESIRED VALUES (BEAMF)
alpha beta
x 0.0000 0.5400
y 0.0000 0.5400
MATCH VARIABLES (NC=4)
MPP MPE VALUE
1 12 9.58586
1 14 -15.89621
1 16 9.45507
1 17 418.83166

CODE: Trace 3-D v68LY
FILE: Full_RT.t3d
DATE: 01/28/2009
TIME: 12:45:43

Gradients:
MEBT – 9-19 T/m
CH - 12-22 T/m

BEAM AT NEL2= 43

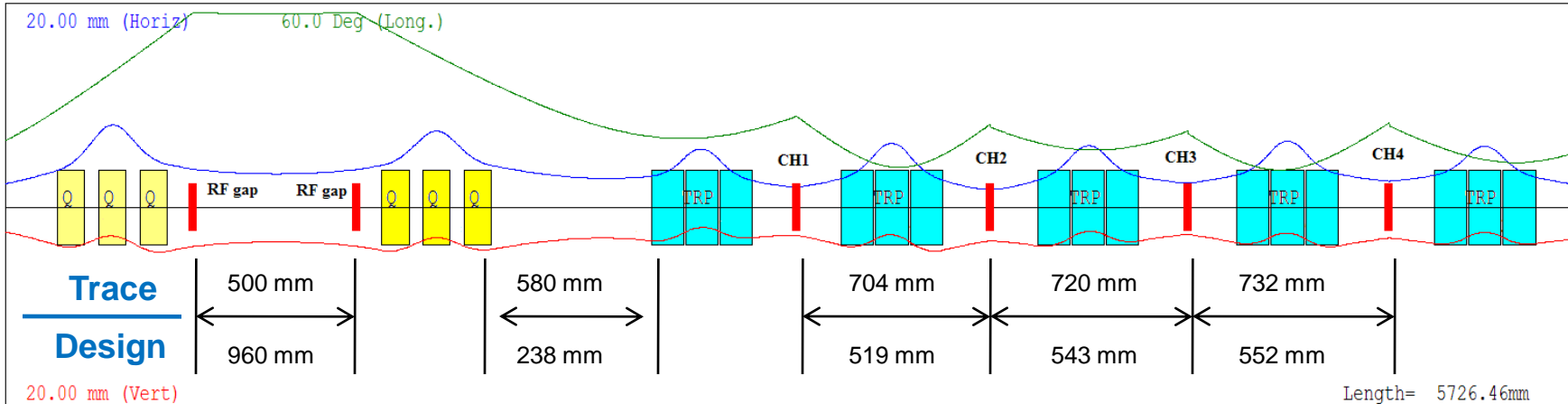
H A= 0.42586 B= 0.33205
V A= 0.41581 B= 0.58227

15.000 mm X 20.000 mrad

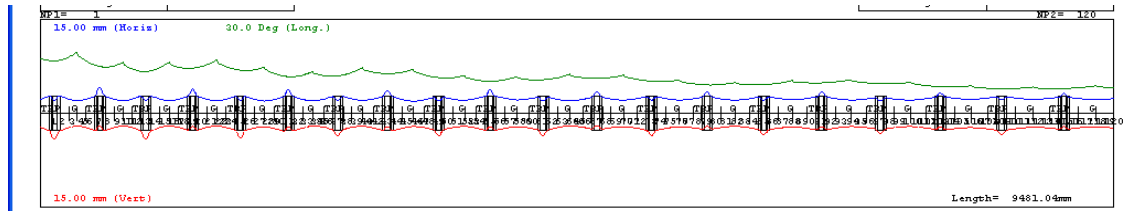
Z A= 0.85630 B= 0.41415

35.000 Deg X 200.00 keV

NP2= 43



Reminder: PMQ option has been considered earlier



Permanent magnet quadrupole for linear collider (Japan)

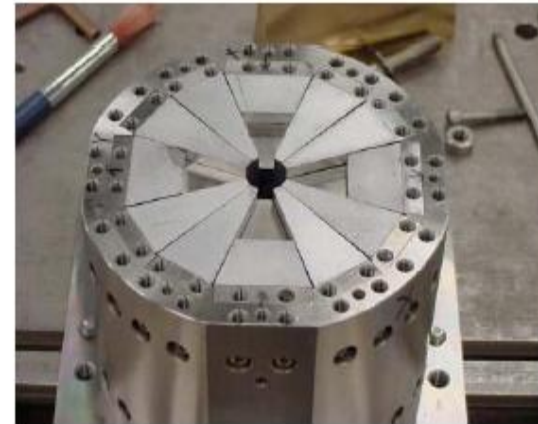
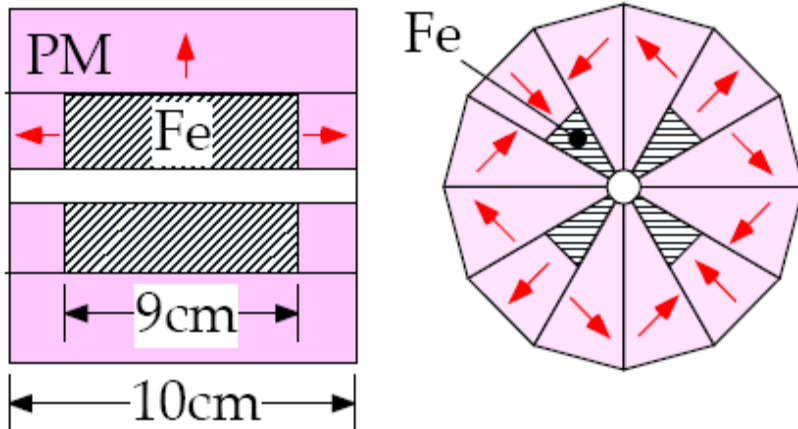


Fig. 7 The PMQ with saturated iron.

Bore 14 mm, outer diameter 100 mm, gradient 300 T/m.

A drawback is its fixed focusing strength, but some tricks have been developed to overcome the problem (Vlad.Kashihin).